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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,089	08/26/2003	Samuel H. Gellman	09820.286	2777

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EXAMINER	
KOSAR, ANDREW D	

ART UNIT	PAPER NUMBER
1654	

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/648,089	GELLMAN ET AL.	
	Examiner	Art Unit	
	Andrew D. Kosar	1654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *1-3,7,10,11 and 13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-6,8,9,12 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/20/04*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *20050420*.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-14 are pending.

Election/Restrictions

Applicant's election with traverse of **Group I, claims 1-10 and 12-14**, with the elected species being AH-III-81, as per the telephone interview with Applicant's agent (*see Interview Summary*, attached) in the reply filed on March 7, 2005 is acknowledged. The traversal is on the ground(s) that there is no burden to search the product and method, and that the patentable distinction between the product and method has not been established, and the Examiner has provided, "no indication as to the feasibility" of the Examiner's method. This is not found persuasive because as indicated, the method can be practiced as claimed with another compound, as indicated in the Restriction Requirement.

The method, as indicated reads upon time-based quantification of the inhibition of Akt phosphorylation of GSK-3α. The method of GSK-3α phosphorylation involves a) introducing an Akt inhibitor, for example staurosporine, to a reaction between GSK-3α and Akt and b) quantifying via Western Blot "any effect of the added compound" on the kinetic parameter of the phosphorylation. Thus, the Examiner has, indeed, met the burden of providing patentable distinction. Further, the method, practiced with an Akt inhibitor is, in fact, quite feasible. Additionally, the method, as claimed, does not require any specific 'protein molecule' or 'fragment thereof'. GSK-3α is a protein molecule, as is Akt. Western Blot probing with an antibody is routine for determining inhibition.

Finally, while Applicant's argue that the Examiner has not established patentable distinction, Applicant's do not state on the record that the claimed inventions are <u>not</u> patentably

distinct. Such a statement would result in withdrawal of the restriction requirement. Applicant's are also reminded that should the products be found allowable, the methods would be rejoined. With regards to burden, the Examiner has, in deed, established burden. As stated, the method search and product search in the non-patent literature would not necessarily lead to the discovery of the all of the products if the method were searched, nor would the search of the compounds necessarily lead to the discovery of all pertinent literature with regards to the method(s).

With regards to the products, Applicant points to MPEP § 803.02. Applicant fails to present the full paragraph, on which Applicant relies. The final sentence recites, "Broadly, unity of invention exists where compounds included within a Markush group (1) share a common utility, and (2) share a substantial structural feature disclosed as being essential to that utility." It is noted that the requirement requires both (1) and (2). Applicant's invention fail in both regards. The disclosed common utility is that the molecules are probes (e.g., page 25, line 9+ "The invention thus enhances... providing a larger "toolbox" of probes to be used in investigating the function of naturally-occurring proteins."; page 24, line 27+ "The utility of the compounds for probing protein interactions is great because..."). The compounds share no substantial structural feature which is disclosed as essential to the utility. The Markush group is not, in fact, 'sufficiently few in number or so closely related', and it would be a burden to search all of the variants embraced by the claims. Thus restriction is proper.

Applicant's arguments have been considered, but are not found persuasive. The requirement is still deemed proper and is therefore made FINAL.

Claim 11 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on March 7, 2005.

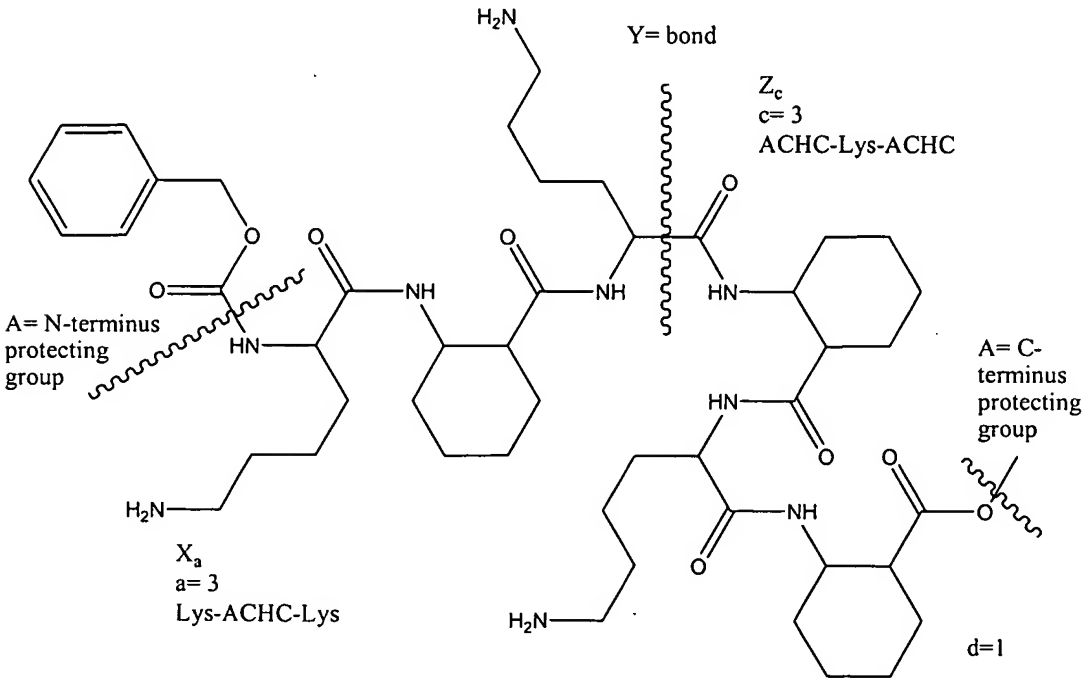
Applicant states that the elected species (AH-III-81) is readable upon claims 4-6, 8, 9, 12, and 14.

Claims 1-3, 7, 10, and 13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on March 7, 2005.

Claims 4-6, 8, 9, 12, and 14 have been examined on the merits.

Applicant's elected species, AH-III-81, was found to be free of the art.

The Examiner extended the search to the species (below) readable upon claims 4-6, 8, 9, 12, and 14:



Specification

The disclosure is objected to because of the following informalities: Applicant refers to a U.S. Patent Application No. 09/502,829, and indicated that is 'allowed'. The Patent number 6,683,154, issued January 27, 2004. The specification should be amended to indicate the patent number. The Examiner notes that the reference is found on page 17 and 21.

Similarly, 09/883,579 is now U.S. Patent 6,710,186, issued March 23, 2004.

Additionally, 09/592,769 (page 21) is not to Gellman, et al. The Examiner cannot find any similar Patent Application, provisional or utility, or Patent number to Gellman, et al. for which Applicant may have intended to indicate.

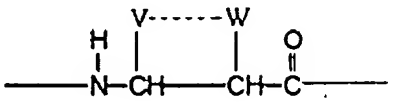
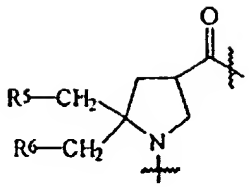
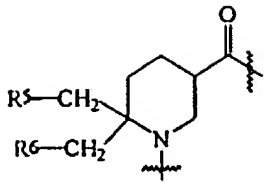
Appropriate correction is required.

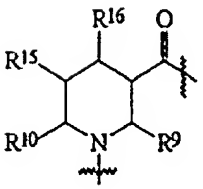
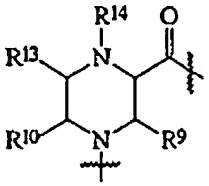
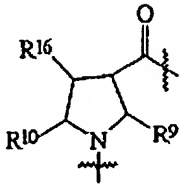
Claim Objections

Claims 4 and 6 are objected to because of the following informalities: While it is clear Applicant is claiming compounds of one generic formula , $A[X_aYZ_c]_dA$, the claim preamble recites, "compound selected from the group consisting of". A group generally requires more than one member, and the claims could be interpreted as being incomplete, as not having an alternative structure than that of $A[X_aYZ_c]_dA$.

Further, with regards to the cyclically-constrained β-amino acid residue, each of the structurally defined options should be recited immediately after the 'selected from the group consisting of' recitation, for clarity, followed by the definitions of the variable groups. For example:

...from the group consisting of:



and


; wherein,

V is …, etc.

Further, while it appears that Applicant is claiming a compound, the claim concludes with the recitation, "and salts thereof." The claim could be misinterpreted as being compositions of the compounds and salts together.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:
Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 4-6, 8, 9, 12, and 14 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility.

The instant claims are asserted to be 'probes' (e.g., page 25, line 9+ "The invention thus enhances… providing a larger "toolbox" of probes to be used in investigating the function of naturally-occurring proteins."; page 24, line 27+ "The utility of the compounds for probing

protein interactions is great because..."). In the instant case, the utility is a 'general utility' (*see MPEP § 2107.01(I)*, "[I]ndicating that a compound may be useful in treating unspecified disorders, or that the compound has "useful biological" properties, would not be sufficient to define a specific utility for the compound. Similarly, a claim to a polynucleotide whose use is disclosed simply as a "gene probe" or "chromosome marker" would not be considered to be specific in the absence of a disclosure of a specific DNA target"; "A general statement of diagnostic utility, such as diagnosing an unspecified disease, would ordinarily be insufficient absent a disclosure of what condition can be diagnosed.").

Further, the MPEP states that the following categories are not substantial utilities: (A) Basic research such as studying the properties of the claimed product itself or the mechanisms in which the material is involved; (B) A method of treating an unspecified disease or condition; (C) A method of assaying for or identifying a material that itself has no specific and/or substantial utility; (D) A method of making a material that itself has no specific, substantial, and credible utility; and (E) A claim to an intermediate product for use in making a final product that has no specific, substantial and credible utility. MPEP § 2107.01(I). Further, with regards to research tools, the MPEP states, "An assessment that focuses on whether an invention is useful only in a research setting thus does not address whether the invention is in fact "useful" in a patent sense. Instead, Office personnel must distinguish between inventions that have a specifically identified substantial utility and inventions whose asserted utility requires further research to identify or reasonably confirm. Labels such as "research tool," "intermediate" or "for research purposes" are not helpful in determining if an applicant has identified a specific and substantial utility for the invention." MPEP § 2107.01(I).

Additionally, the art recognizes no specific or substantial utility for the compound(s) of the invention. For example, Appella (D.H. Appella, et al. J. Am. Chem. Soc. (1999), 121, pages 7574-7581, PTO 1449, 1/20/04) states that, "Creation of new foldamers tests and refines our ability to understand how networks of noncovalent interactions promote adoption of specific shapes by flexible molecules. In addition to this fundamental motivation, foldamer research has practical significance because oligomers with predictable conformations should provide new strategies for mimicry of biomolecular function." (page 7574). Appella-2 (D.H. Appella, et al. J. Am. Chem. Soc. (1999) 121, pages 2309-2310) states that, "The high conformational stability of short oligomers of properly chosen β-amino acids in aqueous solution suggests that β-peptides will provide useful scaffolds for creation of biologically active molecules with predetermined shapes." "Biological applications of β-peptides should be facilitated by their resistance to protease degradation." (page 2310).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:
The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 4-6, 8, 9, 12, and 14 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claims 4-6, 8, 9, 12, and 14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The MPEP states that the purpose of the written description requirement is to ensure that the inventor had possession, as of the filing date of the application, of the specific subject matter later claimed by him. The courts have stated:

> "To fulfill the written description requirement, a patent specification must describe an invention and do so in sufficient detail that one skilled in the art can clearly conclude that "the inventor invented the claimed invention." *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997); *In re Gostelli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) ("[T]he description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed."). Thus, an applicant complies with the written description requirement "by describing the invention, with all its claimed limitations, no that which makes it obvious," and by using "such descriptive means as words, structures, figures, diagrams, formulas, etc., that set forth the claimed invention." *Lockwood*, 107 F.3d at 1572, 41 USPQ2d at 1966." *Regents of the University of California v. Eli Lilly & Co.*, 43 USPQ2d 1398.

The MPEP lists factors that can be used to determine if sufficient evidence of possession has been furnished in the disclosure of the Application. These include "level of skill and knowledge in the art, partial structure, physical and/or chemical properties, functional characteristics alone or coupled with a known or disclosed correlation between structure and function, and the method of making the claimed invention. Disclosure of any combination of such identifying characteristics that distinguish the claimed invention from other materials and would lead one of skill in the art to the conclusion that the applicant was in possession of the claimed species is sufficient." MPEP § 2163.

Further, for a broad generic claim, the specification must provide adequate written description to identify the genus of the claim. In *Regents of the University of California v. Eli Lilly & Co.* the court stated:

"A written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as by structure, formula, [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials." *Fiers*, 984 F.2d at 1171, 25 USPQ2d at 1606; *In re Smythe*, 480 F.2d 1376, 1383, 178 USPQ 279, 284985 (CCPA 1973) ("In other cases, particularly but not necessarily, chemical cases, where there is unpredictability in performance of certain species or subcombinations other than those specifically enumerated, one skilled in the art may be found not to have been placed in possession of a genus ...") *Regents of the University of California v. Eli Lilly & Co.*, 43 USPQ2d 1398.

The MPEP further states that if a biomolecule is described only by a functional characteristic, without any disclosed correlation between function and structure of the sequence, it is "not sufficient characteristic for written description purposes, even when accompanied by a

method of obtaining the claimed sequence." MPEP 2163. The MPEP does state that for a generic claim the genus can be adequately described if the disclosure presents a sufficient number of representative species that encompass the genus. MPEP 2163. If the genus has a substantial variance, the disclosure must describe a sufficient variety of species to reflect the variation within that genus. See MPEP 2163. Although the MPEP does not define what constitute a sufficient number of representative species, the courts have indicated what do not constitute a representative number of species to adequately describe a broad generic. In *Gostelli*, the courts determined that the disclosure of two chemical compounds within a subgenus did not describe that subgenus. *In re Gostelli*, 872, F.2d at 1012, 10 USPQ2d at 1618.

The factors considered in the Written Description requirement are (1) *level of skill and knowledge in the art*, (2) *partial structure*, (3) *physical and/or chemical properties*, (4) *functional characteristics alone or coupled with a known or disclosed correlation between structure and function*, and the (5) *method of making the claimed invention.*

In the instant case, the claims are drawn to isolated, unnatural polypeptide compounds of the generic formula $A[X_aYZ_c]_dA$, wherein A is generally a protecting group, or unmodified peptide terminus, X and Z are α-, β-, and/or γ- amino acid residues; a, c, and d are each > 0; with the provisos that a + c > 3 and the compound comprise at least 1 α-amino acid and 2 cyclically-constrained β-amino acids.

Claims 12 and 14 are drawn to 'isolated unnatural polypeptides comprising' 4 or more, or 6 or more, α-, β-, and/or γ- amino acid residues, with the proviso that at least 2 residues be cyclically-constrained β- or γ- amino acids.

(1) Level of skill and knowledge in the art:

The level of skill in the peptide art is high, as is the knowledge of general peptide synthesis.

(2) Partial structure:

The claims provide a general teaching of partial structure, directed to the general class of components for the structure. The claims and specification are silent to the myriad of compounds embodied by the instant claims, providing for closely related compounds in the specification.

(3) Physical and/or chemical properties:

The compounds must meet requisite physical characteristics, with regards to the type of amino acids that minimally must be present.

(4) Functional characteristics:

The specification and art are silent to any functional characteristics the compounds must have, e.g., inhibitor of ATPase activity, Prolyl peptidase inhibitor, stem cell activator, etc.

(5) Method of making the claimed invention:

Methods of making peptides are well known in the art, and the specification provides synthesis of multimers in the examples.

As stated *supra*, the MPEP states that written description for a genus can be achieved by a representative number of species within a broad generic. It is unquestionable that the claims are broad generics, with respect to all possible compounds encompassed by the claims. The possible structural variations are limitless to any class of peptide, having a minimal number of cyclically-constrained β-amino acids. Further, the length of the peptide and the number of elements within the X and Z subunits are limitless. It must not be forgotten that the MPEP states that if a biomolecule is described only by a functional characteristic, without any disclosed correlation between function and structure of the sequence, it is "not sufficient characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence." MPEP § 2163. Here, though the claims may recite some functional characteristics, the claims lack written description because there is no disclosure of a correlation between function and structure of the compounds beyond compounds disclosed in the examples in the specification. Moreover, the specification lack sufficient variety of species to reflect this

variance in the genus since the specification does not provide any examples of derivatives. While having written description of the compounds identified in the specification tables and/or examples, the specification is absent a sufficient number of peptides to describe the entire genus. In the instant case, the specification, and art, are silent to any functional characteristics.

The description requirement of the patent statue requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See *In re Wilder*, 736, F.2d 1516, 1521, 222 USPQ 369, 372-73 (Fed. Cir. 1984) (affirming rejection because the specification does "little more than outlin[e] goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate.") Accordingly, it is deemed that the specification fails to provide adequate written description for the genus of the claims and does not reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the entire scope of the claimed invention.

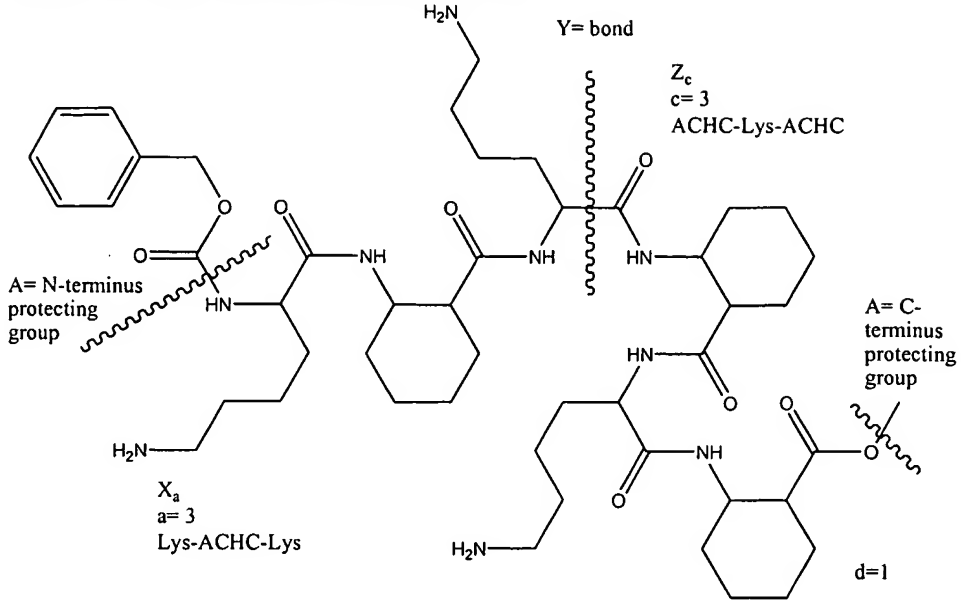
Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 4-6, 8, 9, 12, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Appella-2.

Appella-2, *supra*, teaches the compound:



NO CLAIMS ARE ALLOWED.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew D. Kosar whose telephone number is (571)272-0913. The examiner can normally be reached on Monday - Friday 8am-430pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bruce Campell can be reached on (571)272-097474. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Andrew D. Kosar, Ph.D.
Patent Examiner
Art Unit 1654

Bruce Campell

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